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The Amazon Basin Brazil Nut Industry

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OFFICE OF FOREIGN AGRICULTURAL RELATIONS
UNITED STATES DEPARTMENT OF AGRICULTURE
WASHINGTON, D. C.

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THE AMAZON BASIN BRAZIL NUT INDUSTRY

American nut producers have been interested for the past 20 years in the potentialities of the Brazil nut industry of the Amazon Basin. Prior to the early 1920's few Brazil nuts reached the United States. Today this nut and the cashew are the two leading imported nuts. The loss of European outlets because of war conditions has caused Brazilian exporters to seek other markets. This is a development of interest to United States nut growers, in view of the steady increase in domestic nut production and the loss of export outlets for United States nuts, notably walnuts. This report represents an attempt to provide information which will enable United States nut interests to appraise the Brazil nut situation with some accuracy, to remove some misconceptions, and to aid in formulating future marketing and planting plans.

No recent studies of the Brazil nut have been made available in the English language, and little is known of the tree, the nut, or the industry in the Amazon Basin. It is known, however, that the nut is indigenous to the Amazon region and that attempts to produce it elsewhere, notably in Malaya, have not been commercially successful. The tree is found throughout the Amazon jungles as far inland as Bolivia (fig. 1). Although statistical data are not available, the industry is important in the economy of the Amazon Basin, and the nut is one of the principal products exported from that area.

DESCRIPTION OF THE NUT AND TREE

The nut known in the United States as the Brazil nut has been classified by botanists as *Bertholletia excelsa* (H.B.K.). It belongs to the Lecythidaceae family, of which there are some 11 genera and 118 species in Brazil. Some years ago a botanist held that there were two species of *Bertholletia* in Brazil. Those in the extreme southern part of Venezuela and adjacent Brazilian territory were thought to be *B. nobilis*, while those predominating in the Amazon Basin were *B. excelsa*. The Brazilian Ministry of Agriculture now states that the *B. nobilis* is seldom found in Brazil and that the *B. excelsa* classification is now generally accepted as being correct.

The nut in Brazilian trade circles is now known as castanha do Pará or, translated, Pará chestnut, although it is not related to the chestnut group. The nut was originally called castanha do Maranhão because it was first exported via ports in that State. This name was dropped shortly after 1850 when Pará became a State and the Amazon was opened to foreign navigation.

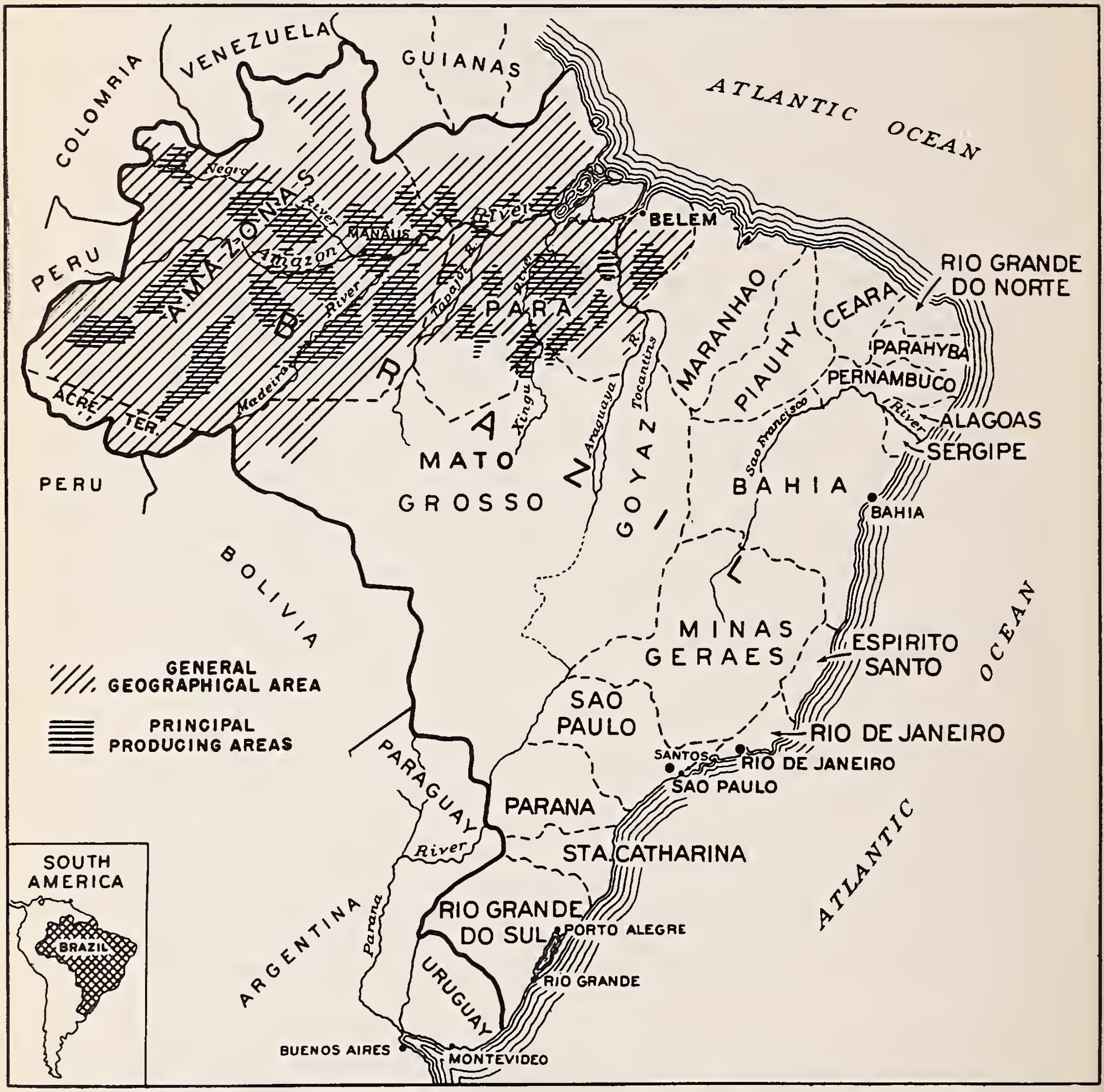

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FIGURE 1.—Brazil nut producing area.

The Brazil nut is also known by such Indian names as nha, nia, invia, tacary, and tucary. It is called touka in French Guiana, although it does not grow there, and it is called juvia in southern Venezuela. In foreign trade it is known as the Brazil, Pará, or cream nut to English-speaking people; as noix du Brésil in French; and as Paranuesse in German.

The kernel of the Brazil nut contains from 65 to 70 percent of oil, which is of a pale yellow color. The total production of oil is very small, as the oil is extracted only as a byproduct from spoiled, and sometimes broken or low-grade, nuts.

An analysis by Schuette, Thomas, and Duthey,[1] showed the following characteristics of Brazil nut oil:

	Expressed oil
Specific gravity 25°/25°	0.9150
Index of refraction 20°	1.4678
Iodine number (Wijs)	99.92
Saponification number	194.0
Ester number	193.9
Reichert-Meissl number	0.0
Polenske number	0.0
Free fatty acids (percent oleic)	0.006
Acetyl number	12.3
Soluble acids (percent as butyric)	0.87
Insoluble acids (percent)	94.16
Unsaturated acids (percent) corrected	73.00
Saturated acids (percent) corrected	20.29
Iodine number of unsaturated acids	129.18
Saponification number of unsaturated acids	199.6
Unsaponifiable matter	0.64

The nut oil contains the following percentages of fatty acids: Oleic 51.26; linoleic 18.84; myristic 1.70; palmitic 12.92; and stearic 2.47. Only 17.09 percent of the saturated acids are accounted for in the analysis.

The food value of Brazil nuts is high compared with that of fruits. The table below shows that it takes only 14 grams to produce 100 calories. It is said that two Brazil nut kernels have the same caloric food value as an average-sized egg.

Table 1.–*Grams of specified foods required to produce 100 calories of energy*

ITEM	QUANTITY	ITEM	QUANTITY
	Grams		*Grams*
Apples	159	Olives	33 to 40
Apricots	174	Oranges	206
Bananas	94	Peaches	242
Brazil nuts	14	Pears	158
Cherries	128	Pineapples	232
Grapes	104	Strawberries	269

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[1] Schuette, H. A., Thomas, Ralph W., and Duthey, Mabel. Brazil nut oil. Amer. Chem. Jour. 52: 4114-4117.

An analysis of Brazil nuts by the Commercial Museum in Belém showed the following composition:

	Percent
Protein	17
Fats	67
Salts	4
Carbohydrates	7
Water	5

The Brazil nut tree is one of the largest in the Amazon Basin, being from 75 to 150 feet high, and usually reaches well above the surrounding jungle (fig. 2). The height of the tree depends on its age, the soil, and other growing factors.

The trunk of the Brazil nut tree is generally smooth and is covered with a brown or ash-colored bark. It is very straight and devoid of lower branches. The crown of the tree spreads out like that of the American white oak and is often as much as 100 feet in diameter. It is covered with large oblong-shaped leaves that are dark green and deeply ribbed. The base of the tree is usually well buttressed, and at maturity the trunk is from 4 to 6 feet in diameter.

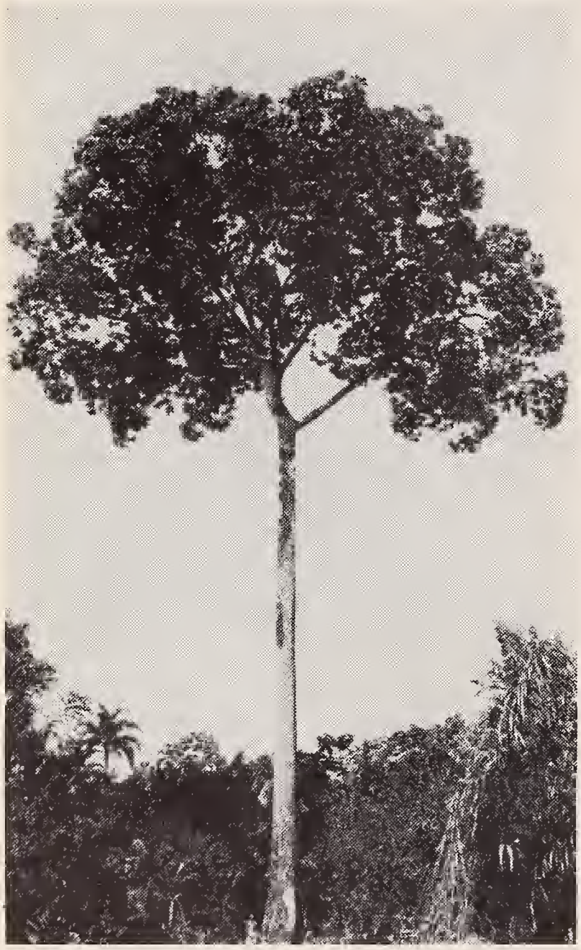

FIGURE 2.-Brazil nut tree towering over other jungle vegetation. Compare the size of the man standing at the base with that of the tree.

The wood is clear-grained and gray in color. The long, straight, thick trunk makes good saw timber, though relatively few trees are felled for lumber because the trees are more valuable for nut production. The bark of the Brazil nut is used in the manufacture of oakum and a coarse cloth used by natives. The bark is also pounded into flexibility for use as sleeping mats by the nut gatherers (castanheiros) and as containers for other jungle products.

The fruit of the tree is a sort of large, woody-shelled capsule, closely resembling a coconut without its husk. The pod is dark brown and from 4 to 6 inches in diameter. It is known as an ouriço, which in Portuguese means "rough prickly shell of chestnut covered with bristles or bristle-like attachments." This description is not altogether accurate because the pod's outer covering is rough but is not covered with bristles (fig. 3). The outer covering of the pod is composed of a brown vegetable substance about one-fourth of an inch thick. This covering in some respects resembles the outer covering of the American Walnut. Unlike that of the walnut, however, it becomes very hard, though somewhat brittle. After the pod falls to the ground the outer covering begins to break, the splits becoming larger the longer the pod remains on the ground.

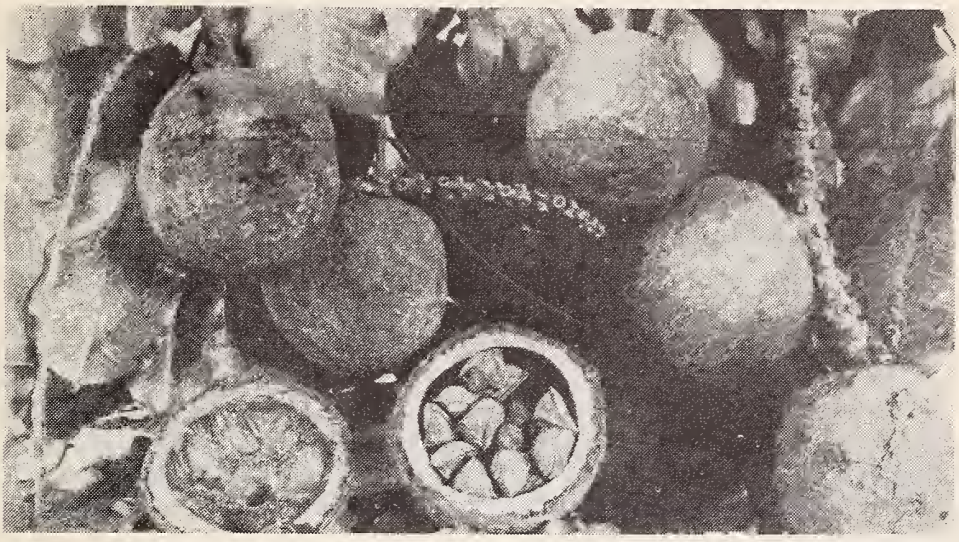

FIGURE 3.-Pods, or ouriços. Note the strong leaves and thick outer layers of the pods protecting the kernels.

Inside the outer shell is a very hard, woody, rough pod about one-fourth of an inch thick. This pod resembles a huge black walnut after the husk has been removed, and contains from 12 to 20 nuts. The pod, when cut and polished, in some respects resembles the grain of bird's eye maple. There appears to be no uniformity as to the number of nuts per pod on any given tree. Several pods from the same tree were cut open and found to contain different numbers of nuts. The experiment was repeated in several different areas with the same result. This divergence is probably due to incomplete pollinization, which results in the development of only a part of the nuts.

FIGURE 4.-Brazil nut tree about 1 year old.

The nuts are arranged in the pod as are the segments of an orange and are held in place by a fibrous growth. This fibrous substance dries as the fruit matures. When the pod falls from the tree to the ground, the impact breaks the fiber into small pieces and loosens the nuts within the pod. If a pod is turned upside down and shaken, the small bits of broken fiber drop out of the stem end. The opening at the stem end of an average pod is about as large as a dime.

The tree grows wild and is propagated by the small nuts in the pods. A notion was prevalent in the Amazon Basin and elsewhere for many years that only the nuts in the pods would germinate, but nuts have been germinated at experiment stations after they were removed from the pod. It usually requires 3 months or more for the nuts to sprout, though under ideal conditions sprouting sometimes takes place in 30 days. The young tree reaches a height of about a foot the first year (fig. 4) and thereafter grows with fair rapidity, reaching a height of 15 to 20 feet in a period of 5 years. The tree fights its way above the surrounding jungle but grows at a somewhat slower rate after the fifth or sixth year.

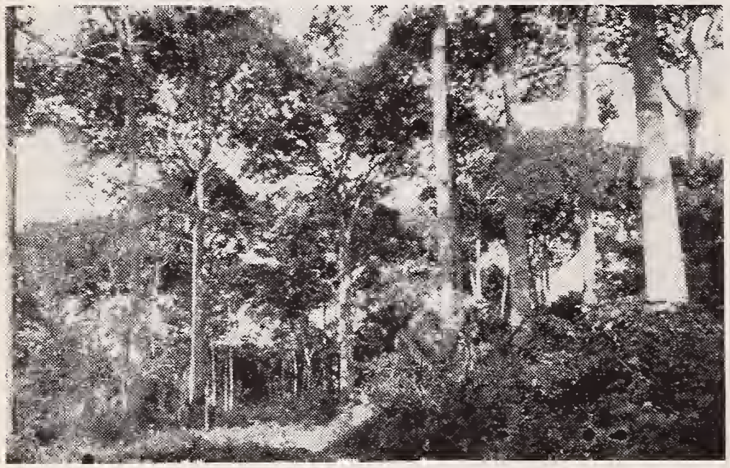

FIGURE 5.- A grove of Brazil nut trees on the Acará River. Note the height and size as compared with other vegetation.

The Brazil nut tree is usually found growing on well-drained ground and seldom within the reach of high water. The tree prefers a clay or clay-loam soil, from 50 to 100 feet from streams or swamps. The trees are usually found in groups of six or more, often forming fair-sized groves (fig. 5). They also are found so far inland that the difficulty in transporting the nuts to the waterways precludes their being harvested.

The tree begins to flower in its fifth or sixth year but little fruit is produced until the twelfth to fifteenth year. Flowering takes place from October to March in most of the producing areas, though in some sections, such as Acre and Rio Negro, blossoming takes place slightly earlier. The flowers grow in cream or white clusters and resemble in some respects the ornamental hydrangea of the United States.

The flowers are borne on the small outer branches. There are generally several clusters of flowers on the same branch, but as a rule only two or three produce fruit. Pollinization appears to be effected by insects flying from one tree to another.

It is usually at least a year from the blossom state to the time when the pods mature and drop to the ground. A point of particular interest is that blossoms and mature, or nearly mature, fruit are found on the Brazil nut tree at the same time. The quantity of blossoms on the tree in a current year, therefore, gives a preliminary indication of the potential yield a year hence. Such a preliminary indication on a commercial plantation of fruits or nuts would normally be of considerable help in forecasting production. In the case of Brazil nuts, however, it is only a partial indication as to what the harvested crop will be because of a great many unpredictable factors. These are chiefly the availability of labor, the amount of water in streams, the occurrence or not of severe windstorms and rainstorms before fruit is mature causing it to fall prematurely, and the prices offered by trading posts to natives.

There is comparatively little loss from disease or insect pests, according to the information available. There is a loss when pods crack and air and rain are admitted, causing the nuts to mold. This cracking may be brought about by disease or insects; however, since it is physically impossible to examine the pods in the tree, because of their great height from the ground, the cause must remain unknown, for the time being at least. Another source of loss is a small jungle rodent, similar in some respects to a squirrel or wood rat, which carries off many nuts for food.

The trees bear about the same quantity of nuts each year, provided growing conditions are satisfactory. The effect of a heavy yield one year on that of the following year is considerably less noticeable than in the case of such cultivated nuts as almonds. Severe storms during the blossoming and pollination period, however, cause a light set for the following year. Since the Amazon Basin is in the Tropics, no frost damage ever occurs. The vast area in which these trees are found naturally makes losses due to the weather inevitable in some parts of the region each year. The total harvest is therefore not materially affected by weather losses, and the economic factors mentioned are far more important in determining production.

CLIMATIC CONDITIONS IN PRODUCING AREAS

The temperature in the Amazon Basin along and near the banks of rivers is relatively uniform and humidity is high. Temperatures during the year vary from 101° to 64° F. The monthly variations between the average maximum and minimum temperatures registered are from 9° to 18°. In the upper regions of the Amazon Valley the variations are somewhat greater, and in Acre Territory they are greater still. The greatest variation in temperature generally occurs during the comparatively dry season, which extends from June through November.

TABLE 2.–*Average temperature at Belém and Manaus*

MONTH	AVERAGE		AVERAGE MAXIMUM		AVERAGE MINIMUM		ABSOLUTE MAXIMUM		ABSOLUTE MINIMUM	
	BELÉM	MANAUS	BELÉM	MANAUS	BELÉM	MANAUS	BELÉM	MANAUS	BELÉM	MANAUS
	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.
January	77.9	80.1	86.4	88.7	72.0	74.7	90.7	98.6	68.5	69.8
February	77.2	80.2	85.6	88.9	72.0	74.7	90.7	96.8	67.6	69.8
March	77.8	79.7	86.0	87.8	72.5	74.5	90.5	96.8	68.5	69.4
April	77.9	80.1	86.5	87.6	72.7	74.8	91.4	94.3	69.3	69.4
May	78.8	80.2	87.6	87.8	72.9	74.8	91.4	95.0	68.4	69.8
June	78.8	80.2	88.2	88.0	71.8	74.8	91.9	95.0	68.9	66.2
July	78.6	81.0	87.8	89.1	71.2	74.5	91.0	93.6	64.4	68.7
August	84.0	81.7	87.8	90.7	71.4	74.8	90.5	96.1	68.0	69.8
September	78.6	82.8	88.2	92.8	70.9	75.0	89.8	99.0	65.5	70.5
October	79.2	84.7	88.5	92.3	70.9	75.7	93.0	99.0	67.6	70.5
November	79.7	82.4	89.1	88.0	71.2	75.6	94.3	99.0	66.9	69.8
December	79.2	80.8	88.2	89.8	72.0	74.8	92.3	101.5	67.5	68.7
Annual	78.6	81.0	87.5	89.6	71.8	74.9	94.3	101.5	64.4	66.2

Belém and Manaus Meteorological Stations.

The rainfall in the Amazon Basin is heavy and typical of the Tropics in this part of the world. The data in table 3 show the monthly distribution of rainfall according to the records at the meterological stations at Taperinha, Manaus, and Senna Madureira for 4, 6, and 10 years of regular observations, respectively.

TABLE 3.-*Recorded rainfall at three Amazon meteorological stations*

MONTH	TAPERINHA, PARÁ	MANAUS, AMAZONAS	SENNA MADUREIRA, ACRE
	Inches	*Inches*	*Inches*
January	6.59	8.30	8.72
February	13.38	8.00	10.49
March	13.06	8.06	8.13
April	12.69	8.44	8.23
May	11.33	6.60	4.59
June	8.09	3.92	1.91
July	5.41	1.82	1.19
August	1.49	1.30	1.65
September	1.27	1.39	4.16
October	4.53	4.59	4.29
November	2.40	4.51	5.38
December	4.73	8.22	12.76
Annual	84.97	65.15	71.50

Brazilian Ministry of Agriculture, 1929.

LOCATION OF PRODUCING AREAS

The Brazil nut tree is found scattered throughout the entire Amazon Basin. Its northern limit is southern Venezuela, or about 5° north latitude, while its southern limit is the Beni Highland in northeastern Bolivia and northwestern Mato Grosso in Brazil, about 14° south latitude. Its western limit is eastern Colombia and Peru near the Brazilian and Bolivian borders.

This report deals primarily with those varieties found in Acre Territory and the States of Amazonas, Mato Grosso, and Pará, or, roughly speaking, the Brazilian part of the Amazon Basin. This area extends over about 1,288,000 square miles, or approximately 39 percent of the area of Brazil. Production in Bolivia, Colombia, Peru, Venezuela, and Mato Grosso is relatively unimportant. Exports from these areas generally move to market via the Brazilian States of Amazonas or Pará.

Belém, the capital of Pará, is located near the mouth of the Amazon River. It is the largest city in the area and in 1939 was credited with a population of 318,341. Manaus, the capital of Amazonas, with a population of 93,748, is the next largest city, while Rio Branco, the capital of Acre Territory, has a population of 31,239. In addition to these capital cities there are a number of other fairly important towns, such as Itacoatiara and Santarém, located up the river from Belém.

The people living in these cities are in general typically Brazilian, a mixture of whites, mulattoes, mestizos, Negroes, and Indians. The back country and interior is somewhat different in that the percentage of whites is lower and that of the colored and mixed bloods is higher. Some Japanese have also established plantations in the Amazon Basin.

TABLE 4.–*Area and density of population of the Brazil nut producing area, 1939*

REGION	TOTAL AREA	WOODED AREA	POPULATION (estimated)	DENSITY OF POPULATION PER SQUARE MILE
	Square miles	*Square miles*	*Number*	*Number*
Acre Territory ..	57,153	57,153	122,099	2.1
Amazonas	705,017	649,972	459,747	.6
Pará	526,242	355,965	1,676,592	3.2
Total or average	1,288,412	1,063,090	2,258,438	1.7

Brazilian Ministry of Foreign Affairs, 1939-40.

The inhabitants of the Amazon Basin are known as caboclos, meaning "copper colored ones." The term originally referred to Indians but now includes the whites, mestizos, mulattoes, Indians, and Negroes who live in the interior. It is from the ranks of these caboclos that the castanheiro, or nut gatherers, are drawn.

The Amazon Basin is larger than the combined area of the 11 Western States of the United States (see table 5), or more than eight times the size of California. It is nearly a hundred times as large as the Netherlands, whose citizens were said to have been the first foreigners to recognize the value of the Brazil nut. The wooded area alone is seven times the size of the State of California.

In contrast with the figure of 1.7 for the population density of the Amazon Basin, the preliminary 1940 United States census for the 11 Western States shows a density of 11.8 persons per square mile. In this group, California is credited with 44.1, while Nevada, the most sparsely settled, has only 1.0 per square mile. The Netherlands, whose area is only one one-hundredth that of the Amazon Basin, had a density of 680.1 persons per square mile in 1937.

The comparisons presented in the preceding paragraphs and tables give some idea of the vast expanse and sparse population in the region in which the Brazil nut is found. The region is unbelievably rich in natural jungle resources, which 400 years after discovery have hardly been tapped.

The wooded area of more than a million square miles is, for the most part, dense tropical jungle. There are as many as 150 species of trees to an acre, and it is said that there are over 2,500 species in the territory. The nature of the region makes it understandable why the number of bearing castanha trees in Brazil is unknown. A mathematical approach to the solution of this question might be made by dividing total average annual production by the estimated yield per tree. The average annual production for the 10 years 1931 to 1940 was 40,400 short tons, and the average yield per tree is said to be from 500 to 800 pounds of nuts, not including the weight of the outer shell. If the lower figure of 500 pounds is used, it is indicated that some 161,600 trees are harvested during an average year. The yield, however, may average considerably less, and there are perhaps hundreds of thousands of trees from which the fruit is never harvested.

TABLE 5.–*Area and population of the Amazon Basin, with comparisons, 1940*

AREA	POPULATION (1940)	AREA	DENSITY OF POPULATION PER SQUARE MILE
	Number	*Square miles*	*Number*
Amazon Basin[1]	2,258,438	1,288,412	1.7
Netherlands	[2] 8,474,506	13,202	680.1
Arizona	499,261	113,580	4.4
California[3]	6,907,387	156,803	44.1
Colorado	1,123,296	103,967	10.8
Idaho	524,873	82,808	6.3
Montana	559,456	146,316	3.8
Nevada	110,247	109,802	1.0
New Mexico	531,818	121,511	4.4
Oregon[3]	1,089,684	96,350	11.3
Utah	550,310	82,346	6.7
Washington	1,736,191	66,977	26.0
Wyoming	250,742	97,506	2.6
Total 11 Western States	13,883,265	1,177,966	11.8
Georgia[3]	3,123,723	58,518	53.4
Oklahoma[3]	2,336,434	69,283	33.7
Texas[3]	6,414,824	263,644	24.3

[1] Acre, Amazonas, and Pará only.

[2] 1937.

[3] Principal United States nut-producing States: California, Georgia, Oklahoma, Oregon, and Texas.

There are only two commercial plantings in the Amazon Basin, as far as could be ascertained by the writer. The largest plantation is near Manaus and contains about 4,000 trees between 12 and 15 years old. The other plantation, near Belém, contains about 1,000 trees approximately 8 years old. These plantations are too young to give any satisfactory idea as to whether or not they represent economically sound ventures in the face of the abundance of wild trees. The length of time and the cost involved in bringing a plantation of these trees into bearing are probably the main reasons why there have not been more plantations established.

DEPENDENCE ON RIVERS FOR TRANSPORTATION

The Amazon Basin, comprising the mighty Amazon River and its innumerable tributaries, extends over an area of more than a million and a quarter square miles. This vast region depends almost entirely on water transportation for freight movements (fig. 6). There is airplane service once a week from Belém to Manaus and Porto Velho, but no freight is carried by air.

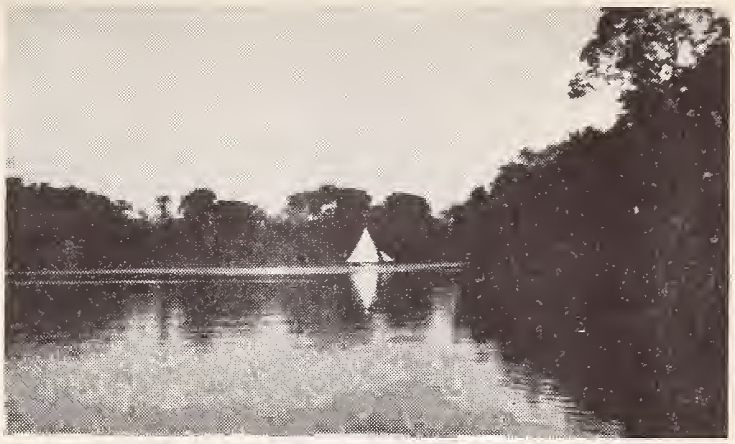

Figure 6.—A bend in the Acará River showing the dense vegetation and a small schooner loaded with jungle produce headed for Belém markets. The taller trees in the background are Brazil nut trees.

The Amazon River is more than 150 miles wide at its mouth and is navigable by large ocean-going vessels as far as the city of Manaus, 1,000 miles from the Atlantic. By the use of shallow draft ships the Amazon is navigable all the way to Iquitos, some 2,300 miles from the mouth. Many tributaries are good sized rivers and can be used most of the year by smaller ships for transportation far into the interior. The Madeira, for example, is able to accommodate ocean-going vessels of 6,000 tons. Some of the other important tributary rivers are the Tocantins, Xingú, Tapajóz, Purús, Juruá, Acre, Solimões, Trombetas, Negro, Branco, Parú, Cajary, and Maraca. All of these rivers figure prominently in the production and transportation of Brazil nuts (fig. 7). In addition to the many tributary rivers, there are hundreds of small creeks (called igarape, meaning "canoe path") which are used for canoes by the natives.

The only railroad in the basin proper is the Madeira-Mamore Railroad, which is only 3-1/8 miles long. It was built to carry freight around the 19 rapids of the Madeira River in the State of Amazonas. Its construction was costly and was inspired largely by the rubber boom many years ago.

The only other railroad in the area is a line which extends about 235 miles from Belém in the direction of the Gurupy River. This railroad, however, does not play an important part in the transportation of freight from the upper river regions.

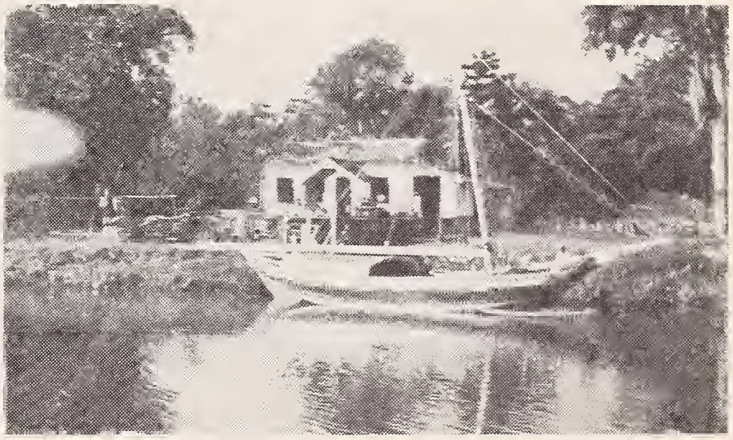

Figure 7.—A typical trading post (barracão) on the Acará. The small schooner in the foreground is used to carry Brazil nuts and other jungle products to Belém and to bring goods back for trade. A Brazil nut tree towers above the building and other vegetation in the background. A pile of hardwood lumber lies in the foreground. The building is built on piling because of the dampness and frequent high water. Note also the very small amount of cleared land surrounding the building.

There are highways leading into the interior from the rivers, but they are usually short and do not connect with others that would make possible a continuous trip, for example, from Belém to Manaus. Road building in the Amazon Basin is an extremely costly and slow process. It is doubtful if an extensive road system will be built in the near future.

GATHERING AND ASSEMBLING OF NUTS IN THE INTERIOR

Harvesting Season

The pods, or ouriços that contain the commercial Brazil nut begin to drop from the trees in late November and continue into early June. There is a slight variation in the season according to the section of the country. Those in Acre and Rio Negro are usually the first to ripen. Because of the immense size of the tree and the pod, the pods are never gathered by ascending the tree.

The action of the winds breaks the heavy pods loose and they drop to the ground. Laborers make it a point not to be under the trees on windy or rainy days, and even on calm days they are constantly on guard against falling ouriços. The pods weigh from 2 to 4 pounds and fall at the rate of from 800 to 1,000 feet per minute. If a laborer is unfortunate enough to be hit by a falling pod he may suffer serious injury, if not death.

Laborers and Their Mode of Life

The laborer, or caboclo, when employed in collecting Brazil nuts is referred to as a castanheiro. He is frequently a migratory worker that follows the Brazil nut and rubber harvests.

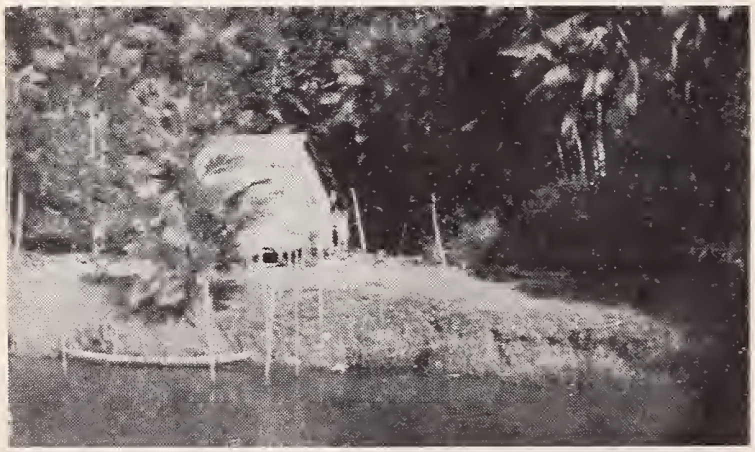

FIGURE 8.—A typical caboclo or castanheiro's home. A canoe like that in the foreground is often the only means of getting from one home to another. The clearing here is less than one-half acre in size, and paths lead fanwise into the jungle from this hut.

The nonmigratory caboclo usually has a hut of some sort, built at the edge of a river or creek (figs. 8 and 9), and from a half to 3 or more acres of land around the shack. The more prosperous caboclos have a few animals, such as pigs, goats, or even cows, provided there is sufficient pasturage for them. They also have a few chickens as a rule, and practically every family has at least one dog.

Wild animals and snakes are a constant menace to the caboclos' livestock and probably account in part for the few domestic animals found in these areas. The caboclo plants mandioca, rice, bananas, and other food plants, if he has the cleared land and the inclination, and also gathers wild edible plants and fruits. The river or creek in front of his place is an ever-ready source of fish, while an occasional wild animal or bird is added to his supply of food.

Starting from the edge of the clearing and running into the jungle fanwise are numbers of paths, or estradas (fig. 10). They consist of trails cut into the jungle by the caboclo and lead from one nut tree to another. A typical estrada may have located on its course Brazil nut, rubber, tonka bean, and other trees that produce commercial crops, and it may be from a few hundred feet to several miles in length. It winds through the jungle from one worth-while tree to another, across small streams, swamps, and fallen logs, depending on the particular terrain. There is an almost constant struggle between the jungle and the caboclo in his attempt to keep the estrada open.

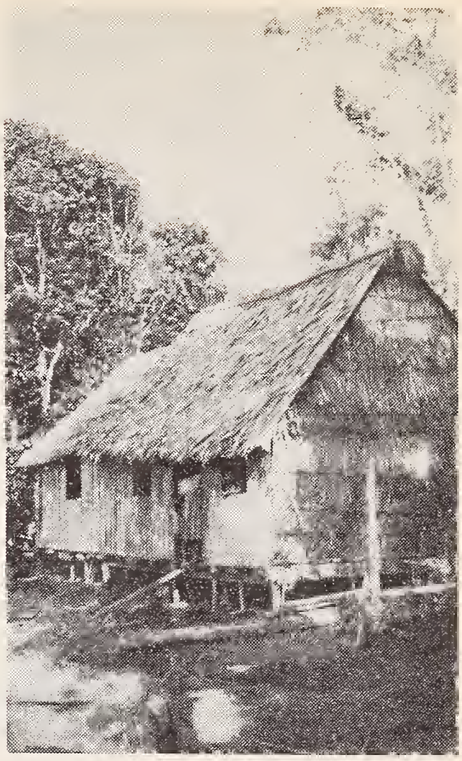

FIGURE 9.—Close up of a caboclo's hut, showing its construction and the family of the castanheiro.

The migratory workers usually occupy abandoned shacks or set up their own temporary dwelling. The abundance of palms and other trees makes the latter a comparatively simple task. A few pots and pans, a little bedding or hammocks, a terçado (large knife) or two, and a few other small items make up the necessary possessions of both the migratory and the resident caboclo. Moving is a relatively simple matter when everything, including family and dog, can be easily loaded into a canoe.

The migratory worker usually goes into the jungle to collect Brazil nuts only when other more profitable work is not available. He stays only as long as he feels that collecting Brazil nuts is the best source of income available, or during the 4 to 6 months' rainy season when he cannot work at rubber gathering and other occupations. The resident caboclo, on the other hand, continues to gather nuts as long as they are available and at the same time collects every other salable product of the jungle. When work slackens on his estradas he may clear more land around his hut or cut a new estrada.

The harvesting period in general is from November to June (fig. 11), and its activity is dependent upon the availability of labor, which in turn is more or less determined by prices received for the nuts at the barracão, or trading post. When prices of unshelled nuts go down to 2 cents or less per pound, f.o.b. Belém or Manaus, the returns to labor are no longer attractive and gathering stops or is greatly reduced. This was clearly demonstrated during the 1940 season, when prices at Belém for a short period reached a very low level. On the other hand, since the vast bulk of the annual production must be transported by water, a cessation of gathering operations during the rainy or high-water period makes it difficult to bring additional supplies to tidewater even should prices strengthen appreciably.

The dampness and heat of the region make it impossible to store even 1 year's production of Brazil nuts in the jungle for disposal the following year. The nuts are almost certain to spoil and, therefore, there can be no carry-over. When nuts are said to be "abandoned" in the jungle, the word is used literally.

Methods of harvesting

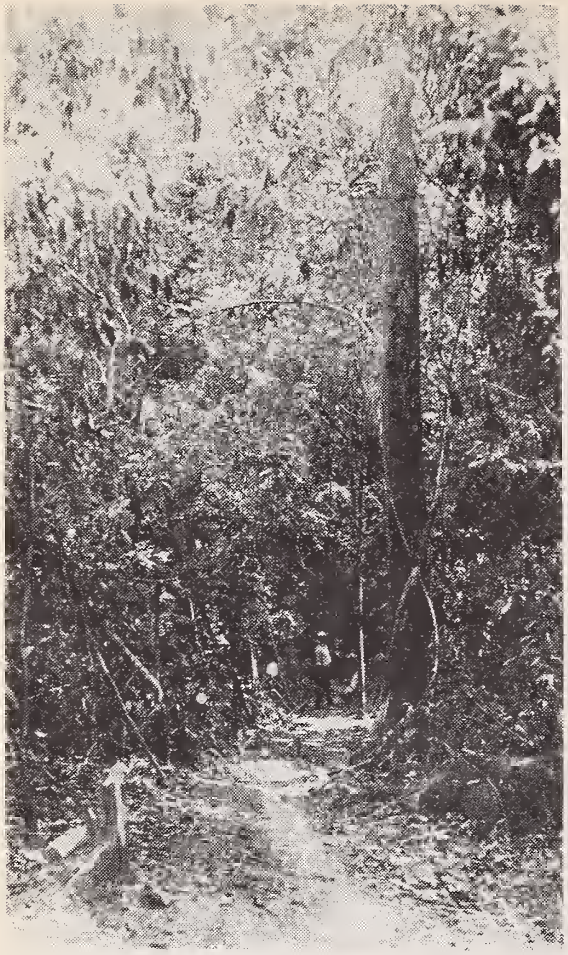

FIGURE 10.—A typical estrada on the Tapajóz River in Pará. To the right of the path is a Brazil nut tree.

The gathering or harvesting operations are comparatively simple. The caboclo and possibly the members of his family follow the estrada to the tree or trees. They collect the pods in baskets or throw them out from under the trees and collect them later. The pods are then carried to the camp where they are cut open with a terçado, a long knife similar to a sugarcane knife and one of the prized possessions of all caboclos. Terçados are obtained from the local trading post at from 40 to 80 cents, depending on size, quality of steel, and type of handle. Formerly these knives were manufactured in the United States and other foreign countries and exported to Brazil, but now they are manufactured in Brazil.

The task of cutting open the pods is usually reserved for days on which it is dangerous to be under the trees because of the wind or rain. Sometimes, however, the other members of the castanheiro's family do this part of the work. The pod, which is extremely hard and requires considerable effort to open, contains from 12 to 20 nuts. The nuts are put into a basket or on mats on the ground until a sufficient quantity has been collected to deliver to the local trading post.

The nuts are washed by the castanheiro and then sold in lots of approximately 1 hectoliter (about 112 pounds). The empty pods are used for fuel in the caboclo's camp or are discarded, though a few are used for cups and other household utensils. They could probably be used profitably in the manufacture of some byproduct, such as charcoal.

Whether the land on which the trees are found is publicly or privately owned makes little difference to the caboclo. Where the land is privately owned, he is compelled by law to deliver the produce to the owner, who either runs the barracão (trading post) or has someone else run it for him. If the land is publicly owned, the caboclo may collect nuts and other products without payment of taxes and may sell wherever he chooses. There is no control exercised by the State over harvesting on publicly owned land. During the past 20 years, however, most of the suitable Brazil nut areas have passed into private hands in one way or another.

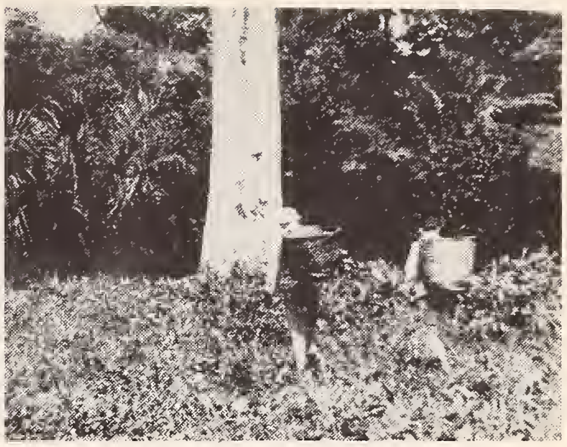

FIGURE 11.—Caboclos gathering Brazil nut pods. Note the size of the tree trunk.

THE TRADING POST

Location and Methods of Trading

Trading posts are usually located a few miles apart on the banks of the larger streams in the Brazil nut area. There is little incentive for the caboclo to carry his produce any farther than the nearest post. He exchanges his produce, which in addition to Brazil nuts may include rubber, hides, cacao, tonka beans, and other commodities, for such items as hardware, matches, cotton, cloth, mandioca, flour, dried beef, and sugar. He delivers his produce frequently, even though he does not require supplies, and is given credit against future purchases. The season's purchases usually just about use up all he has earned. If not, he receives cash or additional merchandise to settle the account. He usually handles very little actual cash during the year because he receives his pay in merchandise.

The price received by the caboclo for his nuts is indirectly affected by the f.o.b. price in Belém or Manaus: that is, the more difficult the transportation to the export centers, the higher the freight and consequently the smaller the amount paid the caboclo. It ranges from 15 milreis a hectoliter to 40 milreis (from about 75 cents to $2 a hundred pounds). Occasionally, however, the price drops to as low as 10 milreis per hectoliter (about 50 cents a hundred pounds). The price paid the caboclo is not based on the size of the nuts, for he brings in his produce ungraded and receives no more for large nuts than for small ones. The hectoliter basket used in interior trading contains from 112 to 130 pounds; thus the trader apparently makes a small profit on the weight.

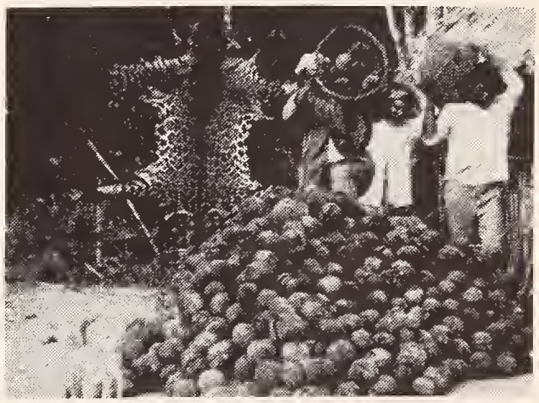

FIGURE 12.—A pile of pods in front of a caboclo's hut ready to be opened. A jaguar skin is stretched in the background.

However, the nuts are damp when delivered to the barracão and lose some weight in the storage bin.

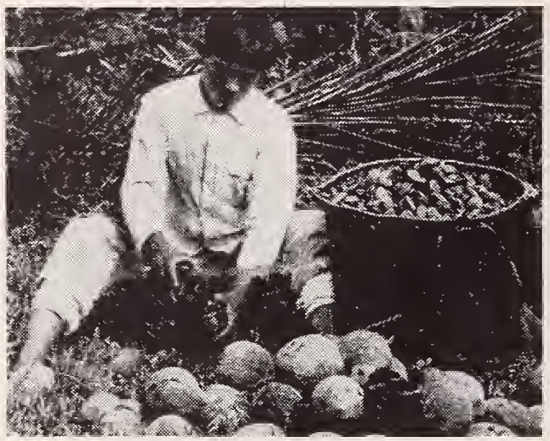

FIGURE 13.—Caboclo opening pods with a tercado. The basket of nuts will be taken to the trading post.

Role of Traders in the Industry

Each trader has from a few to perhaps as many as 200 or more caboclo customers - fregues - in his trading area. He collects the various commodities received in trade until he has enough to ship to Belém or Manaus, where he disposes of them through brokers or exporters. He sells his wares to the caboclo at a mark-up of seldom less than 100 percent and, it is said, occasionally even as much as 300 percent.

Such an advance in price seems excessive, but the trader's cost of doing business is high. He must pay the cost of sending the produce to the export centers and of getting his trade goods back to his place of business. Some traders have their own small schooners that carry from 8 to 10 tons and cost from $4,000 to $6,000. If a trader owns a schooner, he merely hires a crew to take it loaded with his goods to Belém or Manaus and to bring back his purchases. On occasion he may also carry goods for other traders, if space is available on his schooner. A trader may contract with owners of schooners, barges, river boats, etc., to carry his freight both ways. In any event, there is a freight bill both ways to be considered, and the distance from export centers increases or decreases this expense.

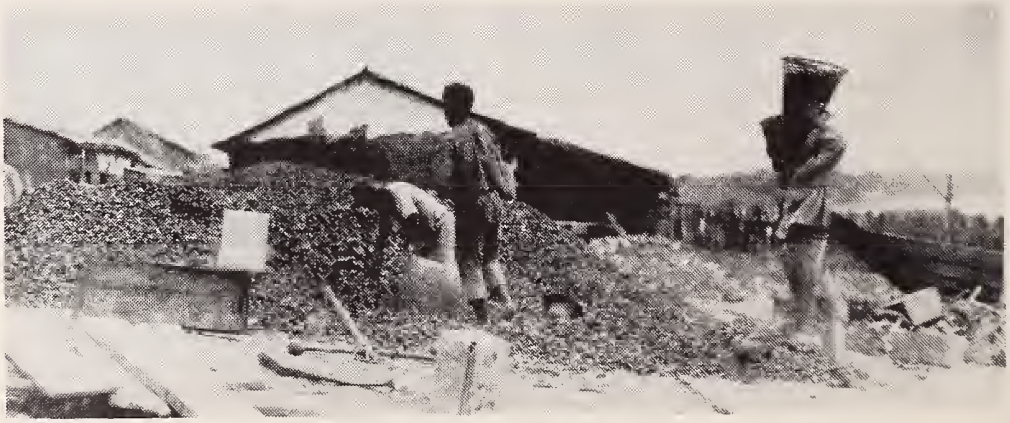

FIGURE 14.—A pile of Brazil nuts on the banks of the Tocantins River awaiting shipment to Belem.

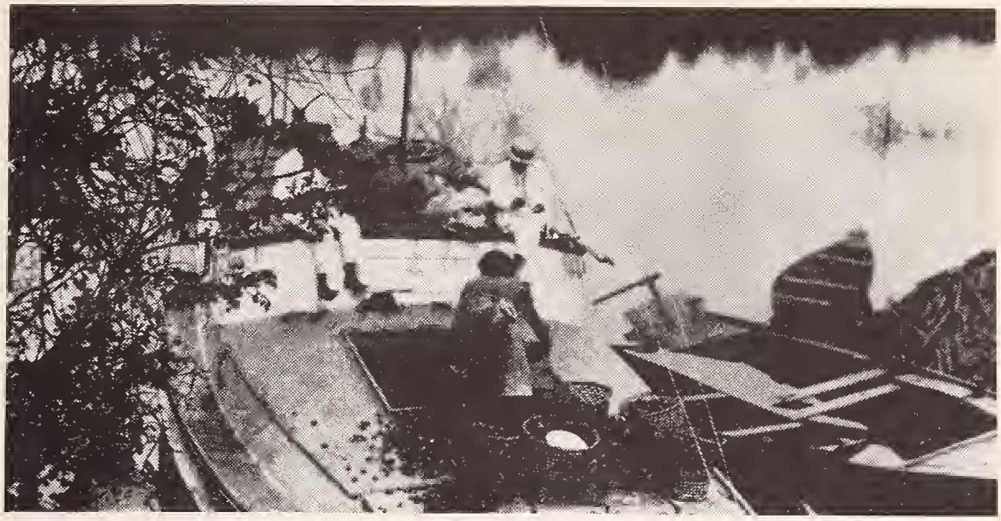

FIGURE 15.—Brazil nuts being loaded in bulk onto a launch on the Tocantins River for shipment to Belém.

In addition, the trader must stand the risk of a fluctuating market for the goods he has taken in trade. He may find that the nuts he has taken in trade at 40 milreis have dropped to 25 at Belém. He must also figure shrinkage, spoilage, and interest on his investment. The profits of the trade, therefore, are not as large as might be thought from the mark-up.

There are hundreds of trading posts in the Amazon Basin, all sending their collections of Brazil nuts and other commodities to the export centers, Belém and Manaus. Upon arrival in these centers the nuts are sold through brokers to exporters or shellers, the proceeds being credited to the trader's account at firms supplying him with trade goods, or credited to his account at the bank.

The combined collection of Brazil nuts by these traders runs into a substantial tonnage each year, and this tonnage, rather than the total yield of all the trees in the Amazon Basin, is the "production" given in Brazil nut statistics.

The production of nuts depends not so much on the yield of the trees as it does on foreign demand. If there were sufficient foreign demand at remunerative levels production would be greatly expanded. Strong foreign demand would result in higher prices, which in turn would cause traders in the interior to make more effort to tap areas normally not harvested. As it is, only the most readily accessible stands are now being worked.

A leading Brazilian exporter summed up the situation as follows: "If the f.o.b. prices in Brazil were doubled or trebled, production could be almost unlimited; but with the quotations of recent years it is doubtful if much more than the average of the past 10 years will ever be exported."

TABLE 6.—*Estimated production of Brazil nuts, 1911-41*

YEAR	BOLIVIA	BRAZIL			BOLIVIA AND BRAZIL
		AMAZONAS	PARÁ	TOTAL[1]	
	Short tons	*Short tons*	*Short tons*	*Short tons*	*Short tons*
1911	(2)	5,400	3,200	8,600	8,600
1912	(2)	13,200	4,300	17,500	17,500
1913	(2)	3,800	800	4,600	4,600
1914	(2)	11,900	5,000	16,900	16,900
1915	(2)	4,500	3,600	8,100	8,100
1916	(2)	7,300	3,900	11,200	11,200
1917	(2)	9,400	8,600	18,000	18,000
1918	(2)	2,600	5,500	8,100	8,100
1919	(2)	13,900	8,900	22,800	22,800
1920	(2)	6,100	4,900	11,000	11,000
1921	500	16,700	10,800	27,500	28,000
1922	(3)	20,000	18,000	38,000	38,000
1923	200	11,700	14,100	25,800	26,000
1924	100	21,700	18,600	40,300	40,400
1925	200	8,200	10,100	18,300	18,500
1926	(3)	14,500	24,700	39,200	39,200
1927	400	11,600	8,200	19,800	20,200
1928	300	11,000	13,300	24,300	24,600
1929	600	19,500	20,000	39,500	40,100
1930	300	10,200	8,600	18,800	19,100
1931	600	18,100	24,600	42,700	43,300
1932	2,000	22,900	13,900	36,800	38,800
1933	2,500	18,400	26,000	44,400	46,900
1934	2,800	22,700	17,000	39,700	42,500
1935	2,700	21,300	26,600	47,900	50,600
1936	2,900	19,200	20,900	40,100	43,000
1937	3,100	11,000	14,900	25,900	29,000
1938	5,300	21,900	19,600	41,500	46,800
1939	4,600	14,600	26,200	40,800	45,400
1940	3,400	23,000	21,200	44,200	47,600
1941[4]	–	–	–	–	25,200
Average:					
1911-1920	(2)	7,810	4,870	12,680	12,680
1921-1930	260	14,510	14,640	29,150	29,410
1931-1940	2,990	19,310	21,090	40,400	45,910

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[1] Acre and Mato Grosso are included in Amazonas and Pará, as nuts from those areas are marketed through these States and separate estimates are not available.

[2] Included in Amazonas or Pará.

[3] Less than 50 tons.

[4] Preliminary forecast for entire Basin. The break-down showing Bolivia, Amazonas, and Pará are not available.

COST OF NUTS AT EXPORT CENTERS

The delivered cost of unshelled nuts at Belém and Manaus varies with the cost of goods at the point of origin and the cost of transportation. Freight costs are relatively high in the area, usually varying between one-fourth and three-fourths of a cent per pound. The freight costs on the Acre and the upper Madeira, Solimões, and Tocantins Rivers are somewhat higher than in other sections. Transportation costs are slowly rising in most parts of the area.

The nuts are handled four or five times between the time they leave the forest and the time they arrive alongside the ocean-going ship, all of which increases their cost to the exporter and consequently to the United States importer. The total cost at the export center is difficult to ascertain: but, if 0.4 cent a pound is allowed

TABLE 7.–*Estimated delivered cost of unshelled Brazil nuts at export center for given prices at trader's post*

PRICE[1] AT TRADING POST		FREIGHT AND LIGHTERAGE	COST TO EXPORTER PER POUND AT EXPORT CENTER[2]
PER HECTOLITER	PER POUND		
Milreis	*Cents*	*Cents*	*Cents*
0	0	0.40	0.40
5	.252	.40	.652
10	.505	.40	.905
11	.555	.40	.955
12	.606	.40	1.006
13	.656	.40	1.056
14	.707	.40	1.107
15	.758	.40	1.158
16	.808	.40	1.208
17	.859	.40	1.259
18	.909	.40	1.309
19	.960	.40	1.360
20	1.010	.40	1.410
21	1.061	.40	1.461
22	1.111	.40	1.511
23	1.162	.40	1.562
24	1.212	.40	1.612
25	1.263	.40	1.663
26	1.313	.40	1.713
27	1.364	.40	1.764
28	1.414	.40	1.814
29	1.465	.40	1.865
30	1.516	.40	1.916
31	1.566	.40	1.966
32	1.617	.40	2.017
33	1.667	.40	2.067
34	1.718	.40	2.118
35	1.768	.40	2.168
36	1.819	.40	2.219
37	1.869	.40	2.269
38	1.920	.40	2.320
39	1.970	.40	2.370
40	2.021	.40	2.421
45	2.274	.40	2.674
50	2.526	.40	2.926
55	2.779	.40	3.179
60	3.032	.40	3.432

[1] Nominal value of the milreis is 5.66 cents; a hectoliter is equivalent to about 112 pounds.

[2] Does not include taxes, insurance, brokerage, commission, revenue stamps, etc.

Calculated from trade data.

as an average freight and lighterage cost and to this is added the value of the nuts at the source, the minimum landed cost is about 0.9 cent a pound, when the trader is forced to sell nuts at the sacrifice price of ½ cent a pound (10 milreis per hectoliter).

The exporter of unshelled nuts must add to this cost Government and State taxes, insurance, commissions, brokerage, revenue stamps, and various other items. These charges are based on the selling price, a fact which complicates their calculation. They are usually about equal to freight and lighterage charges, making the minimum cost to the exporter about 1.3 United States cents a pound. The exporter adds to this minimum cost his profits in the transaction. It is rather obvious from this estimate that the price of 1.3 United States cents, f.o.b. Belém or Manaus, to which the price fell for a short time in 1940, was not very attractive to either the trader in the interior or the exporter, not to mention the laborer who had the work of collecting the nuts.

All cost calculations are based on what appeared to be representative costs during January 1941 and are not the actual average costs of delivering the entire estimated production of any given year.

The Brazilian Ministry of Agriculture in 1928 made a study of Brazil nut exporters' overhead costs. These were based on a purchase price of 32 milreis per hectoliter at Belém or Manaus. The significant point brought out was that approximately 1 cent per pound had to be added to the exporter's purchase price to arrive at his f.o.b. export quotation. The various charges have changed somewhat during the past 10 years and the value of the milreis has dropped 50 percent or more in terms of United States dollars. Notwithstanding these changes, the exporter's total expenses, aside from the purchase price of the nuts but including his commission of 3 percent on the sales price, still amount to about 1 cent per pound.

TABLE 8.–*Estimated Brazil nut exporter's costs, including commission*

ITEMS	PER 1,000 HECTOLITERS	PER 100 POUNDS[1]
	Milreis	*Cents*
Purchase price	32,000	34.20
Commission ½ percent	160	.17
Cost of nuts to exporter at export center	32,160	34.37
Duty (based on a valuation of 35$000 per hectoliter	5,900	6.31
Custom House Examiner 100 reis per hectoliter	100	.11
Chamber of Commerce, 100 reis per hectoliter	100	.11
Baskets 0.1 percent on purchase price	32	.03
Boatman 0.5 percent on purchase price	160	.17
Lighterage 8 days at 70$000 per 1000 hectoliter	560	.60
Interest at bank 1 percent per month	450	.48
Towage of lighters (four trips)	120	.13
Stamps for documents	90	.10
Labor 1 percent on sales price	320	.34
Telegrams	250	.26
Miscellaneous	50	.05
Total exporter's cost	40,292	43.06
Exporter's commission at 3 percent of the sales price	1,246	1.33
F.o.b. value at export center	41,538	44.39

[1] Computed at average exchange rate of 1928 (1 milreis = 11.97 cents).

Brazilian Ministry of Agriculture.

CLASSIFICATION OF NUTS

Unshelled Brazil nuts are classified as large, large medium, good medium, medium, and small. The three largest sizes are generally shipped to the United States. The areas usually producing the various sizes are shown below:

	Sizes
Pará regions and rivers:	
Lower Amazon, south:	
Guama, Capim, Acará, Mojú	Small
Tocantins	Small and medium
Oeiras, Jacundá	Small
Camaraipy, Anapú, Pacaja, Xingú	Small and medium
Curua de Santarém, Tapajóz	Small
Lower Amazon, north:	
Araguary	Small
Maracá	Medium
Cajary, Jary, Parú	Small and medium
Maicurú, Curuá de Alemquer, Rio Branco (Obidos district), Curucamba	Small
Trombetas and affluents:	
Lago do Sapucna	Small
Jamundá (left bank)	Medium and large
Juruty	Small
Amazonas regions and rivers:	
Upper Amazon, south:	
Uicurapa, Andira, Maçary	Medium and large
Maués, Apucuhytaua, Abacaxis, Canuma, Autaz, and lakes	Medium and large
Purús and tributaries, chiefly Ayapua	Large
All affluents of the Solimões from the south between the Madeira and the Jutahy, chiefly Madeira and tributaries (Aripuanã, Mariapaua, Maturá, Atininga, Jatuarana, Capana, Marmellos, Uruapiará, Acará, Baetas, Tres Casas, Cunhian, Maicy, Jamary, Machado, Jacy-Paraná, and Abunã, Manacapurú, Amaná, Badajoz, Caiçara, and Teffé	Medium and large
Upper Amazon, north:	
Jamundá (right bank)	Medium and large
Urubu, Uatuman	Small and medium
Negro, Branco, all affluents of the Solimões from the north between Negro and Japurá	Medium and extra large
Acre Territory	
Acre and tributaries	Small
Bolivia:	
Guaporé, Beni	Medium

The nuts are frequently further classified locally by the areas from which they come. For example, those from the southern bank of the Amazon are Tocantins, Xingú, Tapajóz, Madeira, Purús, Juruá, Acre, Solimões, while those from the northern bank are Rio Negro, Trombetas, Alemquer, Parú, Jary, Cajary, and Maracá. These names, it will be noted, cover the chief tributary rivers in the basin from whose banks and affluents the major supply of Brazil nuts comes. When nuts are distinguished as Tapajoź or Acre they are usually small, and when they are Brancos or Negros they are extra large or medium, etc. There appears to be little difference in the quality of the nuts other than size and thickness of shell.

EXPORTATION OF NUTS

Brokers and exporters

Brazil nuts are sold to exporters through brokers by private negotiation, and the auction market, as such, no longer exists. Sales through brokers are much the same as auction sales, for brokers offer the merchandise to several exporters, the highest bidder receiving the nuts. The number of exporting firms, however, is relatively small, and the prices offered or asked are generally only a fraction apart. At times the prices offered by all the exporters and quoted by the brokers on a given day are identical.

The broker bases his offers to sell to exporters on what he thinks the New York and other foreign markets will pay. If there is a strong demand from abroad, he advances his prices to exporters. Conversely, if there is little demand prices go down.

TABLE 9.–*Annual maximum and minimum f.o.b. prices for unshelled Brazil nuts at Belém*

YEAR	AVERAGE ANNUAL VALUE OF MILREIS	PRICES PER – HECTOLITER IN BRAZILIAN CURRENCY: MAXIMUM	PRICES PER – HECTOLITER IN BRAZILIAN CURRENCY: MINIMUM	PRICES PER – POUND IN UNITED STATES CURRENCY: MAXIMUM	PRICES PER – POUND IN UNITED STATES CURRENCY: MINIMUM
	Cents	*Milreis*	*Milreis*	*Cents*	*Cents*
1911	32.28	35$550	33$700	10.25	9.71
1912	32.36	40$000	15$000	11.56	4.33
1913	32.16	46$600	16$000	13.38	4.60
1914	29.36	24$000	3$000	6.29	0.79
1915	24.67	27$000	5$000	5.95	1.10
1916	23.51	36$000	16$000	7.55	3.36
1917	25.01	36$000	12$000	8.04	2.68
1918	25.34	27$000	10$000	6.11	2.26
1919	26.74	51$000	14$000	12.18	3.34
1920	22.51	76$240	50$000	15.32	10.05
1921	13.12	57$000	22$000	6.68	2.58
1922	12.95	55$000	18$000	6.36	2.08
1923	10.23	101$000	34$500	9.22	1.52
1924	10.94	80$000	20$000	7.81	1.96
1925	12.20	155$000	36$000	16.88	3.92
1926	14.44	58$000	11$000	7.48	1.42
1927	11.84	120$000	50$000	12.69	5.29
1928	11.97	112$000	49$000	11.97	5.24
1929	11.81	68$000	20$000	17.71	2.11
1930	10.71	90$000	21$000	8.61	2.01
1931	7.03	70$000	29$000	4.39	1.82
1932	7.12	60$000	20$000	3.81	1.27
1933	7.96	50$000	16$000	3.55	1.13
1934	8.42	53$000	24$000	3.98	1.80
1935	8.29	105$000	39$000	7.77	2.88
1936	8.56	103$000	69$250	5.29	3.56
1937	8.72	149$166	96$818	8.26	5.37
1938	5.67	101$416	66$583	5.13	3.37
1939	6.00	86$200	70$000	5.31	3.53
1940	6.05	99$000	33$000	5.33	1.78

Compiled from trade sources at Belém.

Before the war the British buyers entered the market early and generally set the pattern of the market for the season. They usually entered in late December made fairly heavy purchases until February, and then reduced their takings. The heavy British buying early in the season had a tendency to raise prices. After the heavy British demand was over, prices weakened until the American demand began to make itself felt in March. American interests contract for the bulk of their requirements from March to June, after which their buying tapers off. The selling and buying procedure for Brazil nuts varies somewhat, but in general follows the usual pattern of international trade. The Brazilian exporter usually has a broker in New York, who attempts to sell importers there and who cables offers to buy or requests firm offers for prospective customers. If offers from New York are not high enough, only sufficient nuts are sold to keep the American importer interested.

As a general rule, Brazilian exporters buy only against orders from abroad though there is some speculative buying. Brazil nuts are always sold for shipment on the first available ship to New York, which in normal times is about every 7 to 14 days.

Some foreign buyers ask for quotations from several New York, London, or Hamburg brokers at the same time. These in turn all cable Brazilian firms for quotations. The buyer believes he is thereby assuring himself the best deal. In some markets and with some commodities he might be right; however, with Brazil nuts such a procedure usually defeats its own purpose. Several exporters enter the market in Brazil at the same time, creating an artificial demand that results in an increase in the f.o.b. price.

During the 1940 season, chaos prevailed in the market, in Brazil as well as in New York, and many firms in both places must have ended the season with unprofitable business in unshelled nuts. British buyers were caught with good-sized commitments on their hands when the Ministry of Food revoked import licenses on May 1, 1940. This action was followed by selling pressure, which forced the prices at one time to as low as 1.3 cents, f.o.b. Belém. The word of these low prices quickly traveled to the interior, and gathering practically stopped. After a few weeks prices gradually began to return to more normal levels. In the meantime, many New York brokers and importers had offered Brazil nuts in the United States at the lowest prices in many years. About the time they attempted to fill their commitments they found prices in Brazil had firmed considerably. In Brazil, on the other hand, exporters were unable to secure additional supplies from the interior. Then followed a period in which prices reached high levels in Brazil, and it was said that some exporters were attempting to buy back their contracts from United States importers. In New York it is alleged importers, in some cases, were buying goods from competitors at prices higher than they had quoted to their customers.

Rumors were circulated in the United States during the season that large quantities of nuts had been abandoned in Brazil and that prices, ex dock New York, were as low as 5 cents, and even lower. There were also reports that huge quantities of nuts would be dumped in the United States. The volume that actually moved at 1.3 cents, f.o.b. Belém, was extremely small, and these sales were of distressed lots only.

Exports of Unshelled Nuts

Apparently the first white people to become interested in Brazil nuts were the Dutch. As early as 1633 the Dutch traded with the natives and sent "wild oil fruits" back to the Netherlands. These "wild oil fruits" are now thought to have been Brazil nuts.

Exports by the Dutch, shipped via ports in Maranhão, were very small and remained so under Portuguese control until after 1800. By 1818 the nuts were moving out of Pará and had become known as Pará nuts. The exportation from Pará practically stopped between 1823 and 1836. From 1836 to 1866 the volume rose gradually when, as a result of the opening of the Amazon to foreign trade, the nuts became one of the major export items of the region. Export records prior to 1890 are not available, and from 1890 to 1929 countries of destination were not given. The available data starting with 1929 shows only the United States, Europe, and "South"[3] as destinations.

TABLE 10.-*Exports of unshelled Brazil nuts from Brazil, 1890-1941*

YEAR	TOTAL[1]	YEAR	TOTAL[1]	YEAR	UNITED STATES	EUROPE	OTHERS	TOTAL[2]
	Short tons		*Short tons*		*Short tons*	*Short tons*	*Short tons*	*Short tons*
1890	220	1910	3,844	Averages:				
1891	6,034	1911	3,179	1890-1899	(1)	(1)	(1)	3,662
1892	3,344	1912	4,262	1900-1909	(1)	(1)	(1)	2,995
1893	2,200	1913	786	1910-1919	(1)	(1)	(1)	4,687
1894	6,242	1914	4,922	1920-1929	(1)	(1)	(1)	19,194
1895	2,453	1915	3,536	1930-1939	8,953	17,701	(3)	26,654
1896	2,612	1916	3,773	1930	5,358	11,416	(3)	16,774
1897	3,592	1917	8,426	1931	11,965	21,596	(3)	33,561
1898	3,586	1918	5,412	1932	9,108	18,061	(3)	27,169
1899	6,336	1919	8,728	1933	8,580	26,468	(3)	35,048
1900	1,144	1920	4,785	1934	6,907	22,310	(3)	29,217
1901	974	1921	11,082	1935	11,074	20,954	(3)	32,028
1902	3,658	1922	17,682	1936	8,818	17,710	226	26,754
1903	4,840	1923	14,020	1937	6,250	8,097	113	14,460
1904	1,342	1924	18,332	1938	10,443	15,392	522	26,357
1905	4,350	1925	10,108	1939	11,028	13,676	472	25,176
1906	2,150	1926	37,730	1940	11,367	5,510	78	16,955
1907	2,832	1927	17,793	1941[4]	1,901	-	3	1,904
1908	4,510	1928	23,036					
1909	4,147	1929	37,375					

[1] Breakdown by country of destination not available.
[2] Includes Bolivian sent via Brazilian ports.
[3] Others, if any, included in Europe.
[4] To end of June.
Brazilian trade and official sources.

The export trade in unshelled Brazil nuts up to the war of 1914-18 was largely in the hands of British, Germans, Netherlanders, and other Europeans. Unshelled nuts were shipped to Europe, shelled there, and some of them were then sent to the United States and elsewhere. German traders sometimes even bought them in Pará, shelled them in Hamburg, and then shipped them back to Rio de Janeiro and other points in South America. The war, however, interfered with this trade to a considerable extent and resulted in many foreign interests going out of business. The years following the war saw many additional firms withdrawing from this trade.

A comparison of the list of exporters before the war and during the early twenties with the current list shows that only a few of the old-time exporters remain today and that the whole trade is gradually being taken over by native Brazilians. Another change is that most exporters now deal directly with the United States and other countries instead of sending the nuts to these countries via England or Germany. Very few unshelled Brazil nuts are to be found in stores in Brazil, south of Belém.

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[3] Southern Brazil and Argentine ports.

Exports of Shelled Nuts

Shelling Industry

Shelling operations in Brazil prior to the last war were on a small scale. The maladjustments in the export movement to Europe brought about by the war of 1914-18 and the good demand from the United States caused the shelling industry to receive a great deal of attention in the late twenties. A number of enterprising and energetic Brazilians started this industry in 1926. Today it has become very important, and practically all shelling of Brazil nuts is now done in Brazil. The industry supplies work for the greater part of the year to about 4,000 workers, mostly women.

Prior to the rise of the Brazilian shelling industry, shelling was done in the United States, Germany, and Great Britain. The shelling industry prospered in the United States from about 1905 to 1925 while that in Great Britain lasted until 1931. Brazil nut shelling operations were abandoned in both countries because of higher labor and other costs compared with those in Brazil.

The largest of the shelling plants at Belém has an annual production capacity in excess of 2,000 short tons. It employs more than 800 workers during the peak season and prepares both shelled and blanched nuts. The plant is the most modern and perhaps the most hygienic in Belém. Great care is given to grade, quality, and sanitation. The industry can be justly proud of this shelling plant and its efforts toward bettering foreign demand by constantly striving to improve the quality of its product.

There are also two other modern, though somewhat smaller, shelling plants in Belém. Other shellers, it has been learned, are planning new modern plants to replace their present ones, which have become either obsolete or too small to take care of the growing business. There are eight shelling plants in Belém, five in Manaus, two small ones in Acre, and two small ones in Bolivia.

The trend of the Brazil nut industry seems to be in the direction of encouraging the exportation of shelled, rather than unshelled, nuts. The shelling industry gives employment in Brazil and, furthermore, shelled nuts bring more foreign exchange than the unshelled. The profits derived by the trade in Brazil on shelled nuts tends to be a little larger than on unshelled exports and there is less worry about spoilage, shrinkage, and outturn weights at destination. Furthermore, shelling costs in Brazil are considerably less than they are in the United States. The demand for shelled nuts from abroad, especially from the United States, is increasing each year. Some sections of the American confectionary trade using nuts have found it advantageous to shift from the more expensive shelled nuts to Brazil nuts. Brazil nut importers have carried on an intensive advertising campaign through their Brazil Nut Advertising Fund to acquaint the American confectionary trade with the shelled Brazil nut and its uses.

Operation of shelling plants and cost of shelling

Shelling plants buy their unshelled nuts through brokers much the same as do exporters of unshelled nuts. The sheller, however, is in a slightly better position on purchases than is the exporter. He can buy odd and distressed lost and store them until needed. Many shelling-plant operators buy for future delivery, although this sometimes works out to their disadvantage. The sheller can buy at times when foreign demand is slack and he need not worry about the grading of the unshelled nuts as to size. His average cost of unshelled, therefore, is usually slightly below that of the exporter. The shelling plant usually manages to keep sufficient unshelled nuts on hand to keep the plant running steadily all season.

The nuts to be shelled are placed in large cement vats and covered with water. They are permitted to soak about 24 hours and then are placed in boiling water for from 3 to 5 minutes to soften the shell. After they are removed from the boiling water, they are taken into the cracking room and placed on the benches of the workers.

The cracking machines are hand-operated and in many respects resemble a home bottle capper, such as is used in the United States. They cost from 25 to 30 milreis ($1.45 to $1.70) each and are made locally. The nuts are placed endwise in a small cup, and the handle of the machine is pressed down until the shell breaks. Care must be taken in this work not to exert too much pressure on the shell and so damage the kernel. In a few of the smaller plants a small piece of iron or a club is used instead of a machine. Also, in a few of the smaller plants the unshelled nuts are not soaked before they are cracked.

Several pounds of nuts are cracked and the kernels and shells are thrown to one side of the bench. The worker then sorts out the sound kernels and pieces and places them in a small wooden box. The shells and spoiled kernels are used as fuel in the furnaces to supply heat for the dryers and power for the shelling plant.

The speed with which some of the girls do the cracking is amazing. They are paid by the quantity shelled per day, the usual rate per kilogram (2.2 pounds) being 400 reis (about 2.3 cents), with the output per girl varying between 15 and 30 kilograms per day. In small plants, employing from 50 to 200 girls, the average output seems to be somewhat higher than in the larger plants, employing over 400. This is probably explained by the fact that as the number of workers increases it becomes more difficult to obtain fast workers and that perhaps there is more lost time. At one time the Brazilian Government enforced a minimum rate of 6 milreis per 8-hour day (about 35 cents), but this was unsatisfactory because many workers began to do less work. The minimum was finally lowered to 4 milreis (about 23 cents).

After the worker has a box full of kernels she receives a metal check, which is later exchanged for money. The poor pieces and foreign matter of the newly shelled nuts are sorted out by other workers, and any bad spots found on the kernels are removed. The nuts are then placed on wire screens and taken to a steam dryer, where they are left just long enough to remove the surface moisture. Drying is necessary because the nuts would spoil quickly if any moisture were to remain on them.

The dried nuts are passed to graders for sizing. For blanched nuts the brown skin is removed before the nuts go to the dryers. The girls doing the grading work receive from 10 to 12 milreis (about 57 to 70 cents) per day of 8 hours.

The ratio of unshelled to shelled nuts varies somewhat. At the beginning of the season a loss of at least 1 percent must be figures for bad nuts and foreign matter, such as dirt, pebbles, and sticks. This percentage increases as the season advances, sometimes reaching more than 5 percent. The average shellout from a hectoliter of 112 pounds of good-quality unshelled nuts is about 18 kilograms (40 pounds) of kernels, though it varies from 16 to 20 kilograms (35 to 44 pounds). In actual practice a hectoliter of Brazil nuts at export centers may weigh as much as 120 pounds and as little as 105. The weight depends on the moisture content of the nuts, the size of nuts, and the variation in thickness of the shell, as well as the spoilage, shrinkage, etc.

It should be noted that the estimated shelling ratio is somewhat higher than is normally used for these nuts in the United States. The unshelled nuts received in the United States have been cleaned of the foreign matter and spoiled nuts, commonly found in the shipments from the interior, and have also lost some of their moisture.

The actual cost of producing shelled nuts is not available, but it is known to vary considerably with the different plants and with the quality and cost of the unshelled nuts. The table below gives some estimated factory costs involved in producing shelled nuts for given selling prices of unshelled. The total shown in the last two columns does not include exporter's commission, insurance, factory profit,

TABLE 11.–*Estimated cost of producing one case (66 pounds) of shelled Brazil nuts*[1]

SHELLER'S PURCHASE PRICE FOR UNSHELLED		LABOR COSTS		PACKING MATERIAL PRICES[4]		OVER-HEAD COSTS	TOTAL COST	
PER POUND	PER 200 POUNDS REQUIRED FOR ONE CASE	FOR SHELLING[2]	FOR PACKING, GRADING, ETC.[3]	TIN CANS	WOODEN CASES		PER CASE	PER POUND
Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Cents*
1.13	2.26	.906	.453	.566	.169	.226	4.58	6.94
1.70	3.40	.906	.453	.566	.169	.226	5.72	8.67
2.26	4.53	.906	.453	.566	.169	.226	6.85	10.38
2.83	5.66	.906	.453	.566	.169	.226	7.98	12.09
3.40	6.79	.906	.453	.566	.169	.226	9.11	13.80
3.96	7.92	.906	.453	.566	.169	.226	10.25	15.53
4.53	9.06	.906	.453	.566	.169	.226	11.38	17.24
5.09	10.02	.906	.453	.566	.169	.226	12.34	18.70
5.66	11.32	.906	.453	.566	.169	.226	13.64	20.67
6.23	12.45	.906	.453	.566	.169	.226	14.77	22.38
6.79	13.58	.906	.453	.566	.169	.226	15.90	24.10

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[1] Conversions made at the current rate of 5.66 cents to the milreis.

[2] Includes piece work at rate of 400 reis per kilogram - about 2.3 cents per pound.

[3] Labor costs in recent years have been gradually increasing.

[4] The cost of tins and packing cases has increased as a result of the war. In January one can was said to cost 5.8 milreis - 33 cents - and it was difficult to obtain cans even at that price.

and other expenses necessary to prepare the goods for loading on board ship. The charges to be added to the factory costs also vary greatly; but in general when the f.o.b. price for unshelled at Belém is about 2½ cents per pound, the f.o.b. price for shelled is about 13 cents. Shellers deal largely in futures, and shelled quotations may therefore not always closely follow the market for unshelled.

Quality and quantity of shelled nuts exported

Shelled nuts purchased in the United States or elsewhere at much below the prevailing price are generally of inferior quality. Some exporters of shelled nuts, who consistently underbid the market price, ship nuts of the lowest possible quality that will be accepted. The whole industry is injured by such trading, and every effort should be made to prevent it.

TABLE 12.–*Exports of shelled Brazil nuts from Brazilian ports, 1926-41*

YEAR	UNITED STATES	EUROPE	OTHERS[1]	TOTAL[2]
	Short tons	*Short tons*	*Short tons*	*Short tons*
1926	104	–	–	104
1927	274	28	4	306
1928	410	10	1	421
1929	644	64	2	710
1930	682	53	1	736
1931	3,186	59	17	3,262
1932	3,159	153	18	3,330
1933	2,997	377	36	3,410
1934	3,840	405	38	4,283
1935	5,992	206	84	6,282
1936	4,517	144	39	4,700
1937	3,076	119	357	3,552
1938	3,416	265	635	4,316
1939	4,364	714	400	5,478
1940	7,233	187	82	7,502
1941[3]	3,732	–	–	3,732

[1] Mostly to southern Brazil and Argentina.

[2] Bolivian nuts included.

[3] To end of June.

Brazilian trade statistics.

The rapid increase in domestic shelling from 1926 to 1940 is indicated by the increased exports of shelled nuts (see table 12). From an initial exportation of 104 tons in 1926 exports gradually increased until they reached 736 in 1930, and by 1935 had jumped to 6,282 short tons of shelled nuts, an increase to 60 times the original exports of 1926.

In 1926 United States imports of shelled Brazil nuts totaled 865 short tons, of which, according to Brazilian export data, only 104 short tons were direct shipments.

By 1931, United States imports reached 3,039 tons and Brazilian exports destined for this country were recorded at 3,186 short tons. The difference in these figures is partially explained by the fact that December exports from Brazil do not enter United States import figures until January and consequently show up in the following calendar year's imports. Also, imports into the United States are sometimes held in bonded warehouses until needed and are therefore not entered in import-for-consumption statistics for some months after they leave Brazil.

In 1931, for the first time, imports of shelled Brazil nuts into the United States came directly from Brazil. Since that year nuts shelled in Europe have not

TABLE 13.–*Imports into the United States of Brazil nuts for consumption, compared with United States nut production, 1924-41*

YEAR	UNITED STATES IMPORTS OF BRAZIL NUTS FOR CONSUMPTION		UNITED STATES ESTIMATED PRODUCTION (UNSHELLED BASIS)				
	UNSHELLED	SHELLED	ALMONDS	FILBERTS	PECANS	WALNUTS	TOTAL
	Short tons	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*
1924	22,731	1,666	8,000	–	18,999	24,650	51,649
1925	11,662	161	7,500	–	26,232	36,550	70,282
1926	19,986	865	16,000	–	47,930	15,900	79,830
1927	11,642	749	12,000	60	18,252	52,100	82,412
1928	10,538	1,480	14,000	200	34,275	27,400	75,875
1929	14,629	1,721	4,700	200	25,592	43,250	73,742
1930	7,782	1,312	13,500	300	26,050	29,750	69,600
1931	12,328	3,039	14,800	420	41,830	34,000	91,050
1932	9,184	2,828	14,000	490	29,665	48,500	92,655
1933	9,001	3,019	12,900	1,070	34,415	33,000	81,385
1934	8,583	3,992	10,900	1,210	23,238	45,800	81,148
1935	11,208	4,440	9,300	1,240	52,988	55,200	118,728
1936	10,186	4,823	7,600	2,100	20,068	43,300	73,068
1937	6,388	3,686	20,000	2,570	38,447	60,100	121,117
1938	10,293	4,030	15,000	2,240	24,860	50,800	92,900
1939	11,424	4,826	19,200	3,750	31,820	59,400	114,170
1940	13,203	7,033	10,200	3,210	44,213	46,400	104,023
1940	[1] 231	[1] 1,828	10,200	3,210	44,213	46,400	104,023
1941	[1] 354	[1] 2,885	[2] 6,500	[2] 4,550	[2] 43,117	[2] 59,500	[2] 113,667
Average:							
1926-30	12,915	1,225	12,040	152	30,420	33,680	76,292
1931-35	10,061	3,464	12,380	886	36,427	43,300	92,993
1936-40	10,299	4,880	14,400	2,774	31,768	52,000	100,942
1931-40	10,180	4,172	13,390	1,830	34,154	47,650	97,024

[1] Admitted for consumption January through June.

[2] Preliminary forecast September 1, 1941.

Official Brazilian export statistics, and Agricultural Statistics, U. S. Department of Agriculture.

been imported by the United States. The Brazilian shelling industry has taken full control of the trade. The volume of United States imports increased gradually and by 1940 had reached 7,033 short tons.

The shelling industry in Bolivia did not get started until 1931, in which year 20 tons of nuts were sent via Brazilian ports to the United States. The following year such exports jumped to 317 tons and have shown a steady increase since. Bolivian shelled and unshelled nuts are handled through Brazilian ports and frequently are included in Brazilian export statistics. Unfortunately, from available records it is not possible to segregate them from nuts produced in Brazil.

UNITED STATES LANDED COSTS OF UNSHELLED AND SHELLED NUTS

Before the outbreak of the current war, there were 10 steamship lines regularly calling at Belém and occasionally at Manaus. In addition occasional tramp or chartered

TABLE 14.–*Freight rates on Brazil nuts from specified Brazilian to specified United States ports, 1940*[1]

To Boston, New York, Philadelphia, Baltimore, Norfolk, and Newport News[2]

CLASSIFICATION	BASIS	FROM BRAZILIAN PORT OF–					
		BELÉM[3]		MANAUS		ITACOATIARA	
		CONTRACT	NON-CONTRACT	CONTRACT	NON-CONTRACT	CONTRACT	NON-CONTRACT
		Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
Brazil nuts, in bulk and bags[4]	100 lb.	110	125	123	140	136	155
Brazil nuts, shelled, in cases weighing 30 kilograms net	Case	100	115	100	115	100	115
Cashew nuts, in bags[5]	100 lb.	-	150	-	163	-	176
Cashew nuts, in cases[5]	cu. ft.	-	53	-	56	–	63

To Los Angeles, San Francisco, Seattle, Tacoma, and Vancouver, B. C.[6]

CLASSIFICATION	BASIS	FROM BRAZILIAN PORT OF–			
		BELÉM[3]		MANAUS	
		CONTRACT	NONCONTRACT	CONTRACT	NONCONTRACT
		Cents	*Cents*	*Cents*	*Cents*
Brazil nuts, unshelled	100 lb.	150	170	175	195
Brazil nuts, shelled, in standard boxes of 66 pounds net	Box	130	150	160	180

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[1] Filed with the U. S. Maritime Commission as of March 11, 1940. Rates apply from end to end of ship's tackle.

[2] Amazon River Ports - United States Atlantic Ports Conference. Tariff of local freight rates, effective September 15, 1939, and addendum thereto bearing the same date.

[3] Port of Belém taxes are for the account of cargo. The present tax is 5 reis per kilogram plus 3.5 percent.

[4] These rates are not subject to increases of 33-1/3 percent or 50 percent recorded in addendum, dated September 15, 1939, filed by the Conference with the U. S. Maritime Commission according to its interpretation by the U. S. Maritime Commission.

[5] The rates apparently were increased 33-1/3 percent effective September 15, 1939, according to addendum mentioned in footnote 4.

[6] Pacific Coast - River Plate - Brazil Conference. These rates do not include wharfage or handling at Californian or other Pacific coast ports where assessed. Rates published to expire December 31, 1939, presumably unless extended, tariff filed with U. S. Maritime Commission did not contain an amended page recording the above items as of date of examination (March 11, 1940) by the writer.

ships also called for freight at these ports, so that shipping space was almost always available. The regular ship lines operating on this run are shown below as well as the conference freight rates established by these lines (table 15).

Booth Line
Lamport & Holt Line
American Republics Line
Pacific Republics Line
Westfall-Larsen & Co.
Kawasaki Kisen Kabushiki Kaisya Line
Osaka Syosen Kaisya Line
Yamashita Kisen Kabushiki Kaisya Line
Lloyd Brasiliero
Northern Pan-American Line

Since the war, practically all European ships regularly on this run have been called to service elsewhere. There remain on regular runs only the Lloyd Braziliero, a Brazilian line, and the American Republics Line and Pacific Republics Line of the United States, with only an occasional Japanese, Norwegian, or other foreign ship calling. Those ships still in the service naturally carry the best paying freight, and Brazil nuts previously were not in that class. The result has been a rise in freight rates on Brazil nuts; and even so ship space is hard to get.

The United States import duty on shelled nuts is 2½ cents a pound and on unshelled 3/4 cent a pound. The duty was cut in half on January 1, 1936, as a result of the United States-Brazilian trade agreement.

TABLE 15.—*Estimated minimum landed cost per pound of unshelled Brazil nuts to United States importers at given f.o.b. Belém prices, March 1941*

PRICE TO IMPORTER, F.O.B. BELEM	FREIGHT CONTRACT RATES [1]	ALLOWANCE FOR SHRINKAGE, 15 PERCENT	ESTIMATED MISCELLANEOUS CHARGES [2]	DUTY	TOTAL LANDED COST [3]
Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1.25	1.10	0.35	0.24	0.75	3.69
1.50	1.10	.39	.25	.75	3.99
1.75	1.10	.43	.25	.75	4.28
2.00	1.10	.47	.26	.75	4.58
2.25	1.10	.50	.26	.75	4.86
2.50	1.10	.54	.26	.75	5.15
2.75	1.10	.58	.27	.75	5.45
3.00	1.10	.62	.27	.75	5.74
3.25	1.10	.66	.28	.75	6.04
3.50	1.10	.69	.28	.75	6.32
3.75	1.10	.73	.29	.75	6.62
4.00	1.10	.77	.29	.75	6.91
4.25	1.10	.80	.29	.75	7.19
4.50	1.10	.84	.30	.75	7.49
4.75	1.10	.88	.30	.75	7.78
5.00	1.10	.92	.31	.75	8.08
5.25	1.10	.95	.31	.75	8.36
5.50	1.10	.99	.31	.75	8.65
5.75	1.10	1.03	.32	.75	8.95
6.00	1.10	1.06	.33	.75	9.24
6.25	1.10	1.11	.34	.75	9.55
6.50	1.10	1.14	.35	.75	9.84
6.75	1.10	1.18	.35	.75	10.13
7.00	1.10	1.22	.36	.75	10.43

[1] Lowest pre-war contract rate to American North Atlantic ports. Rates to other American ports are higher. Rates have increased since March 1941.

[2] Includes letter of credit, insurance, cartage, overhead, and storage. The cost of insurance and letter of credit varies with the value of the merchandise. Insurance is 1 percent on the cost-freight value, and letter of credit ½ percent on the cost-freight value. These charges do not include discount.

[3] Does not include importer's profit.

The rate of shrinkage varies, running as low as 12 and as high as 18 percent, but averages about 15 percent for imports into the United States. The importer must also pay the various agency, carrying, letter-of-credit, cartage, handling, and insurance charges. The charges, especially insurance, have shown an upward tendency in recent years.

Landed Cost of Unshelled Nuts in the United States

The landed cost of unshelled nuts estimated in table 15 does not take into account export taxes at Belém and other shipping points. It represents the f.o.b. price quoted in Brazilian milreis and converted to United States cents per pound. The quotations are based on hectoliters of 112 pounds on outturn weights in American ports, and it frequently happens that the hectoliters shipped in Brazil weigh from 114 to 120 pounds, which gives the exporter in that country a small additional profit.

The ocean freight rates used in table 15 are the lowest pre-war contract rates from Belém to North Atlantic ports. The rate from Manaus was 1.23 cents, while that from Itacoatiara and other ports was 1.36 cents and higher. The United States imports

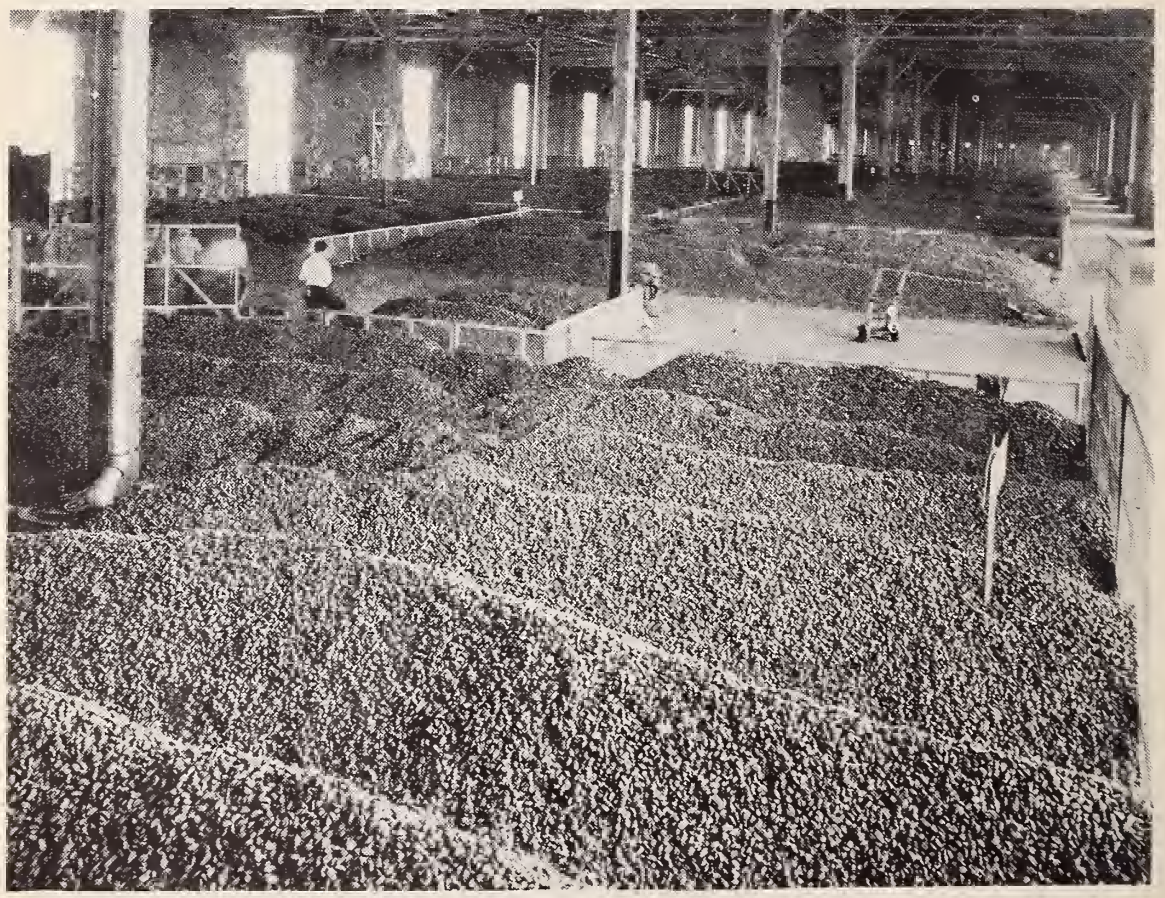

FIGURE 16.—Unshelled Brazil nuts in storage on New York docks.

the larger sized unshelled nuts, which originate upriver from Belém, mostly in the Manaus area (see page 21). It follows, therefore, that the minimum rate used in the calculations in table 15 are on the conservative side.

The cost of shrinkage has been figured at 15 percent on the f.o.b. quotations, plus ocean freight; however, some allowance should be made for insurance and other incidental costs. The cost of insurance, commission, storage, cartage, etc., varies considerably.

The total estimated landed cost at New York or other North American port, duty paid, does not include the importer's profit. Assuming it to be 5 percent, which is hardly a large margin for commodities of this type, it is apparent that, unless the f.o.b. Brazil price for unshelled nuts is less than 2 cents, the ex-dock price in the United States cannot be as low as 5 cents. There can be, and occasionally are, distress sales for 5 cents, but these would account for only a very small percentage of the tonnage during any given season. The landed cost for the Pacific coast works out higher, as the comparable freight rate is 1.50 cents from Belém and 1.65 cents from Manaus. In addition, the longer haul increases some of the other costs, and wharfage and handling at Pacific coast ports must be added.

Landed Cost of Shelled Nuts in the United States

The landed cost of shelled Brazil nuts at North Atlantic coast points is estimated in table 16. There is no shrinkage in shelled nuts, though occasionally some loss is incurred from breakage or spoilage, part of which may be covered by insurance.

TABLE 16.–*Estimated minimum landed cost of shelled Brazil nuts per pound to United States importers at given f.o.b. Belém prices, March 1941*

PRICE TO IMPORTER, F.O.B. BELÉM[1]	FREIGHT[2]	DUTY	ESTIMATED MISCELLANEOUS CHARGES[3]	TOTAL[4]
Cents	*Cents*	*Cents*	*Cents*	*Cents*
9.50	1.51	2.25	0.36	13.62
10.00	1.51	2.25	.37	14.13
10.50	1.51	2.25	.38	14.64
11.00	1.51	2.25	.38	15.14
11.50	1.51	2.25	.39	15.65
12.00	1.51	2.25	.40	16.16
12.50	1.51	2.25	.41	16.67
13.00	1.51	2.25	.41	17.17
13.50	1.51	2.25	.42	17.68
14.00	1.51	2.25	.43	18.19
14.50	1.51	2.25	.44	18.70
15.00	1.51	2.25	.44	19.20
15.50	1.51	2.25	.45	19.71
16.00	1.51	2.25	.46	20.22
16.50	1.51	2.25	.47	20.73
17.00	1.51	2.25	.47	21.23
17.50	1.51	2.25	.48	21.74
18.00	1.51	2.25	.49	22.25
18.50	1.51	2.25	.50	22.76
19.00	1.51	2.25	.50	23.26
19.50	1.51	2.25	.51	23.77
20.00	1.51	2.25	.52	24.28
20.50	1.51	2.25	.53	24.79
21.00	1.51	2.25	.53	25.29
21.50	1.51	2.25	.54	25.80
22.00	1.51	2.25	.55	26.31

[1] Brazilian taxes not included.
[2] Lowest pre-war rate Belém to North Atlantic ports. This rate is now considerably higher.
[3] Includes letter of credit, insurance, cartage, storage, handling, but not discount.
[4] Does not include importer's profit.

TABLE 17.-*Wholesale price of Brazil Nuts per pound at New York, by months, 1929-41*

Unshelled (Large-Medium grade)[1]

MONTH	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
January	19½	9	15½	6	7	8	13	11	15	18	11¾	10	10½
February	–	8½	16	6	7	7½	13	9½	14	18	–	10	10½
March	–	–	16	6	6¾	7½	9½	9½	14	18	10	9½	10½
April	–	–	7¾	6	6	7½	9	9	13	13	9¾	9¾	10
May	8¾	–	7½	5¼	6	7¼	8½	9	13	12½	9	9½	10
June	8¾	13	8	5¼	6½	8	8½	9	13	–	9	6	10
July	8¾	13	8	6¼	7½	8	8¼	9	13	12½	9	6	10
August	9½	14½	8	7½	7½	8	9	11	13	12	9	6	–
September	11	15½	9¾	8¾	8¼	–	10¼	13	16	12	9½	7¼	–
October	11½	16	9¾	8½	8½	–	12½	14½	17	12	9½	9	–
November	11½	15½	9¾	8½	8½	11¼	12½	14½	18	11¾	9¾	9¾	–
December	9¾	15½	9¾	7½	8½	13	12½	15½	18	11¾	10	10½	–

Shelled (Medium-Whole grade)[2]

MONTH	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941
January	52	36	35	24	22	21	25	22½	29½	29	20	20	18½
February	50	36	34	23	20	20	25	22	33	25	20	19	18½
March	46	38	33	23	19	20	21½	22	33	23	19	19	19
April	46	39	29	21	19	20	21½	21½	34	23	19	19	20
May	42	39	27	21	19	20	21½	24	34½	24	20	17	24
June	42	40	27	21	21	21	22	24½	34½	24	20	16½	24½
July	42	40	27	21	21	21	22	25½	34½	24½	19	15¾	24½
August	42	40	27	21	23	21	22½	29	34	23½	18	16	–
September	38	40	25	23	23	23	23½	28	34	23½	20½	17	–
October	38	40	22	23½	22	24	25	29½	34	24	22	18	–
November	38	39	26	22½	21	25	25	29½	33½	23	22	18	–
December	38	36	26	22	21	25	22½	29½	33½	22	21	18½	–

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[1] Midmonth quotations from the New York Journal of Commerce.

[2] Price list of a large importing company in New York City.

Ocean freight at the outbreak of the current war was $1 per case of 30 kilograms (66 pounds) from Belém to North Atlantic ports, equivalent to 1.51 cents per pound. This rate is now somewhat higher with steamship sailings less frequent. Since January 1, 1936, the duty has been 2.25 cents. The figures for insurance, storage, cartage, overhead, etc., estimated in table 16 are probably minimum figures and vary considerably with the various ports of discharge and with the different importers. The combined cost of freight, duty, and miscellaneous charges, using pre-war figures, is 4.12 cents per pound at a price of 9.50 cents, f.o.b. Belém, and gradually increases to 4.31 cents at 22 cents, f.o.b. Belém.

BRAZIL NUT EXPORTS IN THE IMMEDIATE FUTURE

There is much speculation as to whether United States imports of Brazil nuts will continue their present upward trend or level off. The disturbed economic and political conditions in many parts of the world at present make it difficult to make reliable forecasts. The rapidly changing events overseas can make even the most carefully prepared analysis entirely worthless within a few days. Any analysis, therefore, must be made on the basis of facts or conditions known to exist today with the realization that many unpredictable factors may suddenly change the whole outlook.

Consumer purchasing power in the United States appears to be an important factor in determining imports. Tables 13 and 17, for example, indicate that large importations are frequently associated with high prices and that low prices tend to discourage imports. In 1940, however, low prices prevailed and imports were high. This was owing primarily to the cancellation of import permits by the British Government, which resulted in large quantities becoming available on the market in Brazil at low prices. The duty prior to 1936 was 1½ cents a pound for unshelled nuts and 4½ cents for shelled. The duty was cut in half on January 1, 1936, as a result of the trade treaty between Brazil and the United States. The import statistics, however, fail to prove conclusively that the lower duty has resulted in increased imports of unshelled nuts, but there has been a steady increase in the importation of shelled nuts. This increase is thought to be due primarily to the displacement of higher priced nuts from domestic and Mediterranean sources. Brazil nut importers, moreover, have carried on an intensive advertising campaign through their Brazil Nut Advertising Fund to acquaint the American confectionery trade with the uses of the shelled Brazil nut.

At present the factors most likely to affect United States imports in the next few years are directly or indirectly associated with the current war. The war has caused but little shift in the distribution of Brazilian exports of shelled goods, since the volume exported to Europe was relatively small. The cost of production, however, has been affected because of the increased prices of tins used in packing. Not only has the cost of tins gone up, but it is reported that they are difficult to obtain even at higher prices. Exporters in Brazil are now experimenting with other types of containers. The low prices prevailing for unshelled nuts during May and June of 1940, moreover, had a discouraging effect on the laborers and traders in the interior of Brazil, which has prevented them from collecting as many nuts as they did a year ago.

The cost of ocean freight and insurance has also gone up, though these increases are for the account of the American importer and do not affect the f.o.b.

Brazilian prices except as they apply to tins and other production costs. The lack of space on northbound ships is making it more difficult to ship even at higher rates. The shipping situation appears to have but little chance of improving materially during the next 2 years. The lack of shipping space and possibly the smaller production will probably have a restrictive effect on United States imports of unshelled nuts during 1941.

The expected decreased consumer purchases in the United States resulting from increased living costs may be offset by more widespread employment of nuts as a result of national-defense activities. Any possible reduction in nut consumption as a result of increased living costs is more likely to affect the higher-priced nuts than the cheap ones and therefore may be expected to affect domestic nuts more than Brazils.

Cashews, which in normal times are imported from India, are only slightly higher in price than Brazils and for some years have been imported in ever-increasing volume. The war is expected to have a restraining influence on these imports because of the lack of tin and shipping space and increased freight and marine insurance. Any reduction of cashew imports probably would be reflected in increased demand for other low-priced nuts. One result of present unsettled conditions is the strengthening of New York wholesale quotations for both cashews and Brazil nuts. Some Brazilian exporters of shelled nuts believe that cashew imports into the United States more or less determine the volume of shelled Brazil nut imports. This assumption is open to question, as the outlets for these imports in this country are somewhat different; however, if correct an increased demand for Brazil nuts would be indicated.

The purchasing power of European nations for some years after the war is over will probably be low, though some barter arrangements involving Brazil nuts might be made. It is probable that restrictions on the importation of nonessential items will be continued for a time. It will also take at least 2 years to establish normal shipping service, and the more important items of trade will be given preference. The combined effect of these conditions will probably be the continuance of the United States as practically the only outlet of any significance for this important export of the Amazon Basin for the next few years.

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